ABSTRACT OF THE DISCLOSURE

Finite-state systems and methods allow multiple input streams to be parsed and integrated by a single finite-state device. These systems and methods not only address multimodal recognition, but are also able to encode semantics and syntax into a single finite-state device. The finite-state device provides models for recognizing multimodal inputs, such as speech and gesture, and composes the meaning content from the various input streams into a single semantic representation. Compared to conventional multimodal recognition systems, finite-state systems and methods allow for compensation among the various input streams. Finite-state systems and methods allow one input stream to dynamically alter a recognition model used for another input stream, and can reduce the computational complexity of multidimensional multimodal parsing. Finite-state devices provide a well-understood probabilistic framework for combining the probability distributions associated with the various input streams and for selecting among competing multimodal interpretations.